Space Weather Forecast

Issued on Friday 31 January 2025 at 01:37 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated M-class flares. G1 minor geomagnetic storms likely 31 Jan with connection to faster solar winds.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low, with only common class flares observed, the strongest from one of the regions on the northeast disc. There are eight regions on the disc, the majority of which are small and simple with only limited growth. However, there is a cluster of three regions in close proximity to each other in the NE, and these are the most active regions on the disc. They have all shown signs of growth over the past 24 hours, with one region becoming weakly magnetically complex.

A gradual filament (a rope like magnetic and plasma structure) liftoff started in the southeast around 30/1330 UTC. An associated Coronal Mass Ejection (CME) occurred, but currently appears to be slow and not Earth directed.

Solar Wind / Geomagnetic Activity: The solar wind parameters indicated the arrival of a very weak CME, most likely one that left the Sun on the 28th. The solar wind speed, remained at background levels throughout, despite a generally slightly increasing trend. The strength of the solar winds magnetic field, increased from weak levels to become moderate and temporarily strong. The north-south component was predominantly positive until around 30/1830 UTC then fluctuated, becoming temporarily moderately negative. Geomagnetic activity was Quiet increasing Unsettled at the end of the day.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate solar activity is expected with a chance of isolated Moderate flares, primarily from the regions on the northeast disc.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs currently expected, with the outlook dominated by the fast winds from a large recurrent coronal hole in the north centre disk, with onset of fast winds most likely today (31 Jan). Quiet to Unsettled activity is expected initially, but increasing to give a likelihood of Active to Minor Storms, and a slight chance of Moderate Storms through today and tomorrow (31st and 1st). Through days 3 and 4 (2nd and 3rd) activity is expected to gradually decline to Quiet to Unsettled levels.

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background with no solar radiation storms forecast.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	60	50	20	10
Strong	G3	No	1	1	1	0
Severe	G4	No	1	1	1	0
Extreme	G5	No	1	1	1	0

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	50	50	50	50
Very Active	R3-R5 (X Class)	No	5	5	5	5

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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